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| 10/030,675 | 10/01/2002 | Oluf Peter Kaad Johansen | GRP-0009 | 9080 |

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| EXAMINER | |
|---|---|
| DEB, ANJAN K | |

| ART UNIT | PAPER NUMBER |
|---|---|
| 2858 | |

DATE MAILED: 06/23/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

| Office Action Summary | Applicati n No. | Applicant(s) | |
|---|---|---|---|
| | 10/030,675 | JOHANSEN, OLUF PETER KAAD | |
| | Examiner | Art Unit | |
| | Anjan K Deb | 2858 | |

*-- The MAILING DATE of this communication app ars on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☒ Responsive to communication(s) filed on *01 October 2002*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) *1-22* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-12,14-18 and 20* is/are rejected.

7)☒ Claim(s) *13,19,21 and 22* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

## DETAILED ACTION

### *Specification*

1. Applicant is reminded of the proper language and format for an abstract of the disclosure.

The abstract should be in narrative form and generally limited to a single paragraph on a separate sheet within the range of 50 to 150 words. It is important that the abstract not exceed 150 words in length since the space provided for the abstract on the computer tape used by the printer is limited. The form and legal phraseology often used in patent claims, such as "means" and "said," should be avoided. The abstract should describe the disclosure sufficiently to assist readers in deciding whether there is a need for consulting the full patent text for details.

The language should be clear and concise and should not repeat information given in the title. It should avoid using phrases which can be implied, such as, "The disclosure concerns," "The disclosure defined by this invention," "The disclosure describes," etc.

The abstract of the disclosure is objected to because legal phraseology "said", "comprising". Correction is required. See MPEP § 608.01(b).

2. The disclosure is objected to because of the following informalities: Reference to claim numbers in the specification should be deleted.

Appropriate correction is required.

### *Claim Rejections - 35 USC § 102*

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

4. Claims 1,17 are rejected under 35 U.S.C. 102(e) as being anticipated by Hu et al. (US 6,584,417 B1).

Re claims 1,17 Hu et al. discloses directional high-voltage detector for a high-voltage conductor comprising at least one voltage-measuring circuit for measuring voltage $\Delta V$ in said conductor (Fig. 9B), at least one current-measuring circuit (Fig. 9B) for measuring current $\Delta I$ in said conductor and means for determining an energy flow (fault direction) in the conductor on the basis of measurements made by said voltage-measuring circuit and said current –measuring circuit $\Delta V/\Delta I$ ((Fig. 8).

5. Claims 1,17 are rejected under 35 U.S.C. 102(b) as being anticipated by He et al. (CN 1,195,775A).

Re claims 1,17 He et al. discloses directional high-voltage detector for a high-voltage conductor comprising at least one voltage-measuring circuit for measuring voltage in said conductor, at least one current-measuring circuit for measuring current in said conductor and means for determining an energy flow (fault energy) in the conductor on the basis of measurements made by said voltage-measuring circuit and said current – measuring circuit (see Abstract).

***Claim Rejections - 35 USC § 103***

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

7. Claims 2, 9-11, are rejected under 35 U.S.C. 103(a) as being unpatentable over Hu et al. (US 6,584,417 B1) in view of Granville (US 5,181,026).

Re claim 2, Hu et al. discloses all of the claimed limitations as set forth above except voltage-measuring circuit comprising at least one capacitive detector which forms a capacitive coupling with the conductor.

Granville (US 5,181,026) discloses transmission line monitoring system wherein a voltage-measuring circuit comprises at least one capacitive detector which forms a capacitive coupling (capacitive voltmeter) with the conductor (column 2 lines 13-17).

At the time of the invention it would have been obvious for one of ordinary skill in the art to modify Hu et al. by adding voltage-measuring circuit comprising at least one capacitive detector which forms a capacitive coupling with the conductor disclosed by Granville for measuring conductor voltage without making contact with high voltage conductor.

Re claims 9-11 Hu et al. did not expressly disclose current measuring circuit for measuring current by means of magnetic field detector.

Re claims 9-11 Granville discloses magnetic field detector 14 (current transformer or Hall effect current sensing means)(column 14 lines 13-15, column 19 lines 13-20). Providing magnetic shielding to calculating circuit would be required to minimize electromagnetic interference.

At the time of the invention it would have been obvious for one of ordinary skill in the art to modify Hu et al., by adding Hall effect magnetic field sensing means disclosed by Granville for measuring conductor current without contacting the conductor.

8. Claims 3-8, 12, 14-16, 18, 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hu et al. (US 6,584,417 B1) in view of Granville (US 5,181,026) and further in view of Schweitzer (US 5,274,324).

Re claims 3-6, Hu et al. as modified by Granville discloses all of the claimed limitations except detector comprises a metal plate covering a section of the conductor.

Schweitzer (US 5,274,324). discloses high-voltage probe (Fig. 3) comprising a bent metal plate 25, dielectric material 24 disposed between metal plate and conductor, wherein metal plate provides capacitive coupling to ground for measuring voltage of high voltage conductor.

At the time of the invention it would have been obvious for one of ordinary skill in the art to modify Hu et al. and Granville by adding voltage detector comprising a metal plate disclosed by Anderson for measuring voltage by capacitive coupling to ground.

Re claims 7-8, Hu et al. as modified by Granville and Schweitzer lacks one capacitor connected serially to capacitive coupling to a ground potential.

At the time of the invention it would have been obvious for one of ordinary skill in the art to modify Hu et al., Granville by adding capacitor connected serially to capacitive coupling to a ground potential for achieving capacitive voltage division so that the measured voltage is within the range of a voltage-measuring instrument.

Re claims 12,14-15,18, 20 Hu et al. disclose all of the claimed limitations including calculating circuit (Fig. 10) except voltage measuring circuit comprises capacitive detector, and current measuring circuit comprises magnetic field detector.

Granville discloses current measuring by magnetic field detector 14 (current transformer or Hall effect current sensing means)(column 14 lines 13-15, column 19 lines 13-20).

Schweitzer discloses capacitive voltage detector.

At the time of the invention it would have been obvious for one of ordinary skill in the art to modify Hu et al., by adding magnetic field detector disclosed by Granville for measuring current in conductor, and by adding capacitive voltage detector disclosed by Schweitzer for measuring voltage so that the direction of energy flow can be calculated by the method disclosed by Hu et al.

Re claim 20, Hu et al. did not expressly disclose calculation circuit compares a first voltage sample value numerically larger than a constant value with immediately preceding values to determine the sample value closest to zero voltage.

Granville discloses circuit for detecting zero crossings of measured sinusoidal voltage waveforms over time (number of samples). Granville did not expressly disclose comparing first voltage sample to a constant value but would have been obvious to do so for determining a minimum value from plurality of samples (column 3 lines 40-58).

At the time of the invention it would have been obvious for one of ordinary skill in the art to modify Hu et al., by adding circuit for detecting zero crossing disclosed by Granville for monitoring difference in phase angle between voltage and current for determining fault direction.

Re claim 16 Hu et al. did not expressly disclose magnetic field detector comprising magnetic resistant detector.

Re claim 16, Granville discloses magnetic field detector comprising magnetic resistant detector (Hall effect current sensing device) (column 19 lines 13-20).

At the time of the invention it would have been obvious for one of ordinary skill in the art to modify Hu et al., by adding magnetic field detector disclosed by Granville for measuring DC current in conductor.

***Allowable Subject Matter***

9. Claims 13, 19, 21, 22 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter:

Claims 13, 19, 21, 22, are allowable because the prior art does not disclose or fairly suggest calculating direction of energy flow in high voltage conductor wherein the calculation circuit calculates the direction value on the basis of polarities of the current and the voltage between two preceding zero-crossings of the voltage.

***Pertinent Art***

10. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

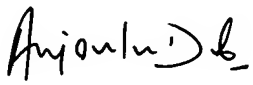
Anderson (US 4,611,207) discloses measuring voltage of high voltage conductor 14 by capacitive coupling comprising plate 16 wherein edges of the plate are bent away from the conductor.

Bunch (US 4,570,231) discloses transmission line fault detection system wherein the detection circuit 13,14 is capacitively coupled 11,12 to high-voltage conductor 10 (Fig. 1).

Tatsumi (US 4,330,749) measuring voltage of high voltage conductor 13 by a circuit comprising capacitive coupling with plate 12 (Fig. 1-2).

***Contact Information***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dr. Anjan K. Deb whose telephone number is 571-272-2228. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, N. Le, can be reached at (571) 272-2233.



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